

CLAIMS

What is claimed is:

1. An imaging system for imaging a bound document, comprising:
a cradle for supporting the bound document;
5 a cradle positioning mechanism configured to selectively position the cradle
and the bound document supported thereon relative to a camera; and
a controller in communication with the cradle positioning mechanism for
controlling the cradle positioning mechanism to automatically position the cradle and the
bound document supported thereon based on the location of the page being imaged
10 relative to the camera.
2. The imaging system of claim 1, wherein the controller controls the cradle
positioning mechanism such that a gutter between two facing pages of the book remains
in approximately a same location relative to the camera.
- 15 3. The imaging system of claim 1, wherein the controller controls the cradle
positioning mechanism such that a surface plane of each page being imaged is
approximately in a same position relative to the camera.

4. The imaging system of claim 1, wherein the controller controls the cradle positioning mechanism such that the positioning of the cradle is a compromise between maintaining a gutter between two facing pages of the book in approximately a same location relative to the camera and maintaining a surface plane of each page being
5 imaged at approximately a same position relative to the camera.

5. The imaging system of claim 1, wherein the cradle positioning mechanism comprises a servo motor and a shaft controlled by the motor to position the cradle.

6. The imaging system of claim 1, further comprising a bearing for supporting
10 the cradle and for guiding the positioning of the cradle

7. The imaging system of claim 1, further comprising a sensor selected from the group consisting of 3D camera, range finder, laser, and edge detector to facilitate the controller in controlling the cradle positioning mechanism based on the location of the page being imaged relative to the camera.

15 8. The imaging system of claim 1, wherein the controller tracks a current page count and controls the cradle positioning mechanism based at least in part on the total number of pages of the document and the current page count.

9. The imaging system of claim 1, wherein the controller controls the cradle positioning mechanism based at least in part on one of a thickness of the document and a width of a gutter of the cradle.

10. The imaging system of claim 1, wherein the controller controls the cradle positioning mechanism based at least in part on a weight of the document exerted on a portion of the cradle.

11. The imaging system of claim 1, wherein the cradle has a pattern on a surface of the cradle facing the camera to facilitate discerning areas over-scanned by the camera.

12. The imaging system of claim 1, wherein the cradle comprises two angled sides for supporting each side of the bound document when the bound document is open, and a gutter between the two angled sides for supporting a center portion of the bound document, the gutter being adjustable in width.

13. The imaging system of claim 1, wherein the cradle comprises two portions movable relative to each other to selectively adjust a width of the gutter.

14. The imaging system of claim 1, wherein the cradle supports the bound document when open such that the opening angle of the bound document is between approximately 100° and 135°.

15. The imaging system of claim 1, wherein the cradle holds the open bound document such that a center axis of the open bound document is tilted at an angle toward an operator.

16. The imaging system of claim 15, wherein the cradle is tilted toward the operator at an angle of approximately 7°-13° relative to a horizontal.

17. The imaging system of claim 1, further comprising a document securing mechanism for securing the document to the cradle, the document securing mechanism being selected from the group consisting of clip, clamp, magnetic plate for insertion inside a front cover of the document, and magnetic plate for insertion inside a back cover of the document.

18. The imaging system of claim 1, further comprising a magnetic plate for insertion inside at least one of a front and a back cover of the document, wherein the cradle is configured such that the magnetic plate is attracted to the cradle to facilitate securing the document to the cradle.

19. An imaging system for imaging a bound document, comprising a cradle for supporting the bound document in an open position, the cradle including two angled sides for supporting each side of the open bound document, the two sides being movable relative to each other so as to selectively adjust a distance therebetween.

20. An imaging system of claim 19, wherein the two angled sides of the cradle form an opening therebetween through which a center spine portion of the bound document is positioned.

5 21. A method for imaging a bound document having multiple pages, the method comprising the steps of:

supporting the bound document in a cradle; and

automatically and selectively positioning the cradle relative to a camera using a cradle positioner controlled by a controller, the positioning being based on the
10 location of the page being imaged relative to the camera.

22. The method of claim 21, wherein the positioning is such that a gutter between two facing pages of the book remains approximately in a same location relative to the camera.

15 23. The method of claim 21, wherein the positioning is such that a surface plane of each page being imaged is approximately in a same position relative to the camera.

24. The method of claim 21, wherein the positioning is a compromise between maintaining a gutter between two facing pages of the book in approximately a same location relative to the camera and maintaining a surface plane of each page being
20 imaged at approximately a same position relative to the camera.

25. The method of claim 21, wherein the positioning includes driving a shaft with a servo motor.

26. The method of claim 21, wherein the cradle is supported by a bearing for guiding the positioning of the cradle.

5 27. The method of claim 21, further comprising the step of sensing a parameter of the document using a sensor selected from the group consisting of 3D camera, range finder, laser, and edge detector to facilitate the controller in controlling the cradle positioner based on the location of the page being imaged relative to the camera.

28. The method of claim 21, further comprising the step of tracking a current
10 page count by the controller, wherein the positioning of the cradle is based at least in part on the total number of pages of the document and the current page count.

29. The method of claim 21, wherein the positioning of the cradle is based at least in part on one of a thickness of the document and a width of a gutter of the cradle.

30. The method of claim 21, wherein the positioning of the cradle is based at
15 least in part on a weight of the document exerted on a portion of the cradle.

31. The method of claim 21, wherein the cradle has a pattern on a surface of the cradle facing the camera to facilitate discerning areas over-scanned by the camera.

32. The method of claim 21, further comprising the step of adjusting a width of a gutter of the cradle according to a thickness of the document, the cradle having two angled sides for supporting each side of the bound document when the bound document is open and a gutter between the two angled sides for supporting a center portion of the bound document.

33. The method of claim 21, further comprising the step of adjusting a width of a gutter of the cradle according to a thickness of the document, the cradle having two portions movable relative to each other to selectively adjust the width of the gutter.

34. The method of claim 21, wherein the cradle supports the bound document when open such that the opening angle of the bound document is between approximately 100° and 135°.

35. The method of claim 21, wherein the cradle holds the open bound document such that a center axis of the open bound document is tilted at an angle toward an operator.

36. The method of claim 15, wherein the cradle is tilted toward the operator at an angle of approximately 7°-13° relative to a horizontal.

37. The method of claim 21, further comprising the step of securing the document to the cradle using a document securing mechanism selected from the group consisting of clip, clamp, magnetic plate for insertion inside a front cover of the document, and magnetic plate for insertion inside a back cover of the document.

5 38. The method of claim 21, further comprising the step of securing the document to the cradle using a magnetic plate for insertion inside at least one of a front and a back cover of the document, wherein the cradle is configured such that the magnetic plate is attracted to the cradle to facilitate securing the document to the cradle.